OVERHEAD SIGNS/TRAFFIC SIGNALS AND LIGHTING STANDARDS ENCROACHMENT PERMIT PROCEDURES

Definitions.

1. Overhead Sign Structures include the following structures:
   Overhead Signs, Truss
   Overhead Signs, Tubular
   Overhead Signs, Changeable Message Signs
   Overhead Signs, Lightweight
   Bridge Mounted Signs
   *Overhead Signs, Cladded Truss
   *Overhead Signs, Box Beam
   Overhead Signs, Box Beam Closed Truss
   Other sign structures that overhang the traveled way or are similar in size or construction to the types given above are often considered Overhead Sign Structures.
   (* Cladded Truss and Box Beam structures are considered obsolete. No permit will be approved.)

2. Roadside Signs are typically signs that do not overhang the traveled way and are not of the types of overhead signs listed above. They are usually not as tall as Overhead Signs and are usually mounted on wood poles.

3. Traffic Signals and Lighting Standards includes the following structures:
   Traffic Signals
   Lighting Standards
   CCTV Structures

Design Code

AASHTO 2001 4th edition. Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals as amended by the 2002 Interims to this document (the code with 2002 interim will be referred to as the 2001 AASHTO code for the remainder of this document).

Certain types of Standard Plan structures, if they do not have any non-standard modifications, may be designed using the 1994 AASHTO code with 80mph design wind speed. These structures types are

Overhead Signs, Lightweight
CCTV 60 through CCTV 90
High Mast Light Pole
Extinguishable Message Signs (Standard Plan ES-14C)

In areas designated as “Special Wind Region” by the 2001 AASHTO code a design wind speed (3-second gust) of 100mph may be used for Standard Plan structures without non-standard modifications. For other structures in Special

OVERHEAD SIGNS/TRAFFIC SIGNALS AND LIGHTING STANDARDS ENCROACHMENT PERMIT PROCEDURES

Wind Regions the basic design wind speed (3 second gust) shall be based on either analysis of local meteorological data or by consulting local authorities that have jurisdiction in the surrounding area of the proposed construction. Refer to the 2001 AASHTO code for additional information and references. The analysis of meteorological data or consultation with local authorities should be fully documented and the documentation submitted with the permit calculations. Where the information available from local authorities or local meteorological data is not sufficient to determine the basic design wind speed then the basic design wind speed shall be based on engineering judgment but shall not be taken as less the 100mph.

For projects where the 2001 AASHTO code does not indicate a special wind region, but the permit applicant determines that local wind conditions justify use of a basic design wind speed higher than 85mph, then the higher wind speed may be used.

Care is needed when getting basic design wind speed information from local agencies. City or county building safety departments are one possible resource. Historically, most local authorities have used basic design wind speeds that are based on fastest-mile wind speeds instead of 3-second gusts. Many building departments have been working on determining 3-second gust values in anticipation of future changes to the California Building Code. They might be able to give a 3-second gust value if specifically asked, However, many personnel from building safety departments may not yet be fully aware of the distinction between 3-second gust and fastest mile wind speeds. Recent editions of ASCE 7 (Standard Minimum Design Loads for Buildings and Other Structures) include information on the approximate relationship of wind speed averaged over different lengths of time. Alternatively, the following table may be used for approximate conversions in lieu of a more sophisticated conversion analysis. Interpolation is permitted between values.

Fastest-mile basic wind speed (50 year return interval)	3-second gust basic wind speed (50 year return interval)
70	85
80	98
90	110
100	122
110	134
120	146

Where the basic design wind speed (3 second gust) exceeds 100 mph, the Importance Factor in Table 3-2 of the 2001 AASHTO code shall be taken from the column for 85-100 mph and not from the column for “Hurricane.” The

OVERHEAD SIGNS/TRAFFIC SIGNALS AND LIGHTING STANDARDS ENCROACHMENT PERMIT PROCEDURES

"Hurricane" importance factors take into account information indicating that hurricanes have a different statistical distribution of top wind speeds than has been commonly assumed for winds in general.

At this time traffic signals, lighting structures, lightweight overhead signs, and CCTV poles are not required to be designed for the fatigue provisions of the 2001 AASHTO code. However, the permit applicant should exercise judgment in determining whether or not to take measures to protect against fatigue failures - such as designing for fatigue, adding vibration mitigation devices, or instituting monitoring programs.

Overhead sign structures shall be designed for fatigue category III or better, except that tubular style Overhead Sign Structures supporting Changeable Message Signs (CMS) shall be designed for fatigue category I.

Table 3-3, "Recommended Minimum Design Life", in the 2001 AASHTO code allows certain structures to be designed for a 25 year design life. This option will not be allowed except in cases where the structure failure is shown not to pose an undue risk (for instance the structure can not collapse onto sidewalk, traveled way, critical infrastructure, etc).

Overhead cantilevered sign support structures with quadri-chord (4 chord) horizontal trusses may exclude galloping loads.

For additional information on requirements and exceptions, see the August 5, 2005 memo "Overhead Sign Structure/Signal and Lighting Standards Policy" at http://pd.dot.ca.gov/pd_memos.asp.

Submittals.

Summarized below are references applicable to encroachment permit submittals. Structural submittals shall conform to the 2001 AASHTO code and Caltrans standard and practices.

References.

1. Standard Plans.

Standard Plans are available at the following web site address:
http://www.dot.ca.gov/hq/esc/oe/project_plans/A62A, Excavation and Backfill – Miscellaneous Details
RS1 to RS4, Roadside Signs
S1 to S22, Overhead Signs – Truss
S30 to S37, S16 to S18 Overhead Signs – Tubular
S41 to S49, S17 Overhead Signs – Lightweight
S81 to S95, Sign Panels

OVERHEAD SIGNS/TRAFFIC SIGNALS AND LIGHTING STANDARDS ENCROACHMENT PERMIT PROCEDURES

S101 to S116, S140 to S142 Overhead Signs – Changeable Message Signs, Model 500
S120 to S142, Overhead Signs – Changeable Message Signs, Model 510
ES-6A to ES-6K, Lighting Standards
ES-7A to ES-7N, Signal and Lighting Standards
ES-7O to ES-7P and ES-11, ES-14C, ES15A and ES15C, ES-16A to ES-16C, Electrical Systems
Other Standard Plans may apply in some situations.

2. Reference Sheets.

Reference Sheets are available at the following web site address:
http://www.dot.ca.gov/hq/esc/techpubs/manual/bridgemanuals/reference-sheets/refer_sheets.html
Sheets 1 to 30, covers the following Structures:
Overhead Signs - Truss
Overhead Signs - Tubular
Overhead Signs - Changeable Message Signs
Overhead Signs - Lightweight
Roadside Signs
For minimum clearance above bridge soffit and maximum height above barrier for Bridge Mounted Signs see Reference Sheet S25.

3. Standard Specifications.

Section 19: "Earthwork"
Section 49: "Piling"
Section 51: "Concrete Structures"
Section 52: "Reinforcement"
Section 56: "Overhead Sign Structures"
Section 59-5: "Painting Sign Structures"
Section 75-1.05: "Galvanizing"
Section 86: "Signals, Lighting and Electrical Systems"
Section 90: "Portland Cement Concrete"

4. Manuals.

- Bridge Memo To Designers **(MTD)** are available at the following web site address:
http://www.dot.ca.gov/hq/esc/techpubs/manual/bridgemanuals/bridge-memo-to-designer/bmd.htm
Chapter 21, Miscellaneous.
Topic 21-11, Mounting Signs and Placing Conduits.
Topic 21-12, Bridge Mounted Signs and Barrier Mounted Signs.

OVERHEAD SIGNS/TRAFFIC SIGNALS AND LIGHTING STANDARDS ENCROACHMENT PERMIT PROCEDURES

Topic 21-13, Overhead Sign Structures. Design forces section of MTD 21-13 version dated November 1998 no longer applies.

- Encroachment Permits Manual **(EPM)**, 7th Edition is available at the following web address:
  http://www.dot.ca.gov/hq/traffops/developserv/permits/encroachment_permits_manual/index.html
  Chapter 500, Specific Encroachment Permits.
  Section 508.9, Engineering Services
  Chapter 515, Signal and Lighting.
  Chapter 517, Traffic Control and Temporary Signals and Signs.

- Bridge Design Specifications
  http://www.dot.ca.gov/hq/esc/techpubs/manual/bridgemanuals/bridge-design-specifications/B-B-specs.htm

5. Standard Special Provisions.

Standard Special Provisions are available at the following web site address:
http://www.dot.ca.gov/hq/esc/oe/conststand.html

6. Other References.

- Project Delivery Memorandums
  Overhead Sign Structure/Signal and Lighting Standards Policy
  http://pd.dot.ca.gov/pd_memos.asp

- AASHTO bookstore web site
  https://bookstore.transportation.org/